

What is claimed is:

1. A light-emitting semiconductor device comprising:
a first reflection film to reflect light with a wavelength

5 λ ;

a light emitting layer formed on said first reflection film,
said light-emitting layer being injected with electric current to
emit light with a wavelength of about λ ;

a second reflection film formed on said light-emitting
10 layer to reflect the light with the wavelength λ , said second
reflection film being provided with a periodical structure
alternately stacked with a first semiconductor layer and a second
semiconductor layer, wherein a reflectivity with respect to the light
with the wavelength λ of said second reflection film is lower than
15 that of said first reflection film;

an electric current spreading layer formed on said
second reflection film to transmit the light with the wavelength λ ,
said electric current spreading layer being the same electronic
conduction type as said second reflection film and having not less
20 than half of a thickness of said second reflection film;

a contact layer formed on said electric current spreading
layer, said contact layer being the same electronic conduction type
as said second reflection film; and

a high resistance region formed in a part of said second
25 reflection film.

2. A light-emitting semiconductor device according to Claim 1, wherein said light-emitting semiconductor device is capable of operating at a speed of not less than 500 Mbps.

5 3. A light-emitting semiconductor device according to Claim 1, wherein said first semiconductor is made of a III-V group compound semiconductor and said second semiconductor is made of a III-V group compound semiconductor in which a V group element is common with that of said first semiconductor.

10 4. A light-emitting semiconductor device according to Claim 2, wherein said first semiconductor is made of a III-V group compound semiconductor and said second semiconductor is made of a III-V group compound semiconductor in which a V group element
15 is common with that of said first semiconductor.

 5. A light-emitting semiconductor device according to Claim 1, wherein said first semiconductor is made of $\text{Al}_j\text{Ga}_{1-j}\text{As}$, ($0 \leq j$), and said second semiconductor is made of $\text{Al}_k\text{Ga}_{1-k}\text{As}$, ($j < k \leq$
20 1), and said electric current spreading layer is made of $\text{Al}_z\text{Ga}_{1-z}\text{As}$, ($0 \leq z \leq 1$).

 6. A light-emitting semiconductor device according to Claim 2, wherein said first semiconductor is made of $\text{Al}_j\text{Ga}_{1-j}\text{As}$, ($0 \leq j$), and said second semiconductor is made of $\text{Al}_k\text{Ga}_{1-k}\text{As}$, ($j < k \leq$
25 1), and said electric current spreading layer is made of $\text{Al}_z\text{Ga}_{1-z}\text{As}$,

($0 \leq z \leq 1$).

7. A light-emitting semiconductor device according to Claim 3, wherein said first semiconductor is made of $\text{Al}_j\text{Ga}_{1-j}\text{As}$, ($0 \leq j$), and said second semiconductor is made of $\text{Al}_k\text{Ga}_{1-k}\text{As}$, ($j < k \leq 1$), and said electric current spreading layer is made of $\text{Al}_z\text{Ga}_{1-z}\text{As}$, ($0 \leq z \leq 1$).

8. A light-emitting semiconductor device according to Claim 4, wherein said first semiconductor is made of $\text{Al}_j\text{Ga}_{1-j}\text{As}$, ($0 \leq j$), and said second semiconductor is made of $\text{Al}_k\text{Ga}_{1-k}\text{As}$, ($j < k \leq 1$), and said electric current spreading layer is made of $\text{Al}_z\text{Ga}_{1-z}\text{As}$, ($0 \leq z \leq 1$).

9. A light-emitting semiconductor device according to Claim 1, wherein said second reflection film is made of a III-V group compound semiconductor in which an average Al composition is not less than 0.4 and said electric current spreading layer is made of a III-V group compound semiconductor in which an Al composition is not less than 0.2.

10. A light-emitting semiconductor device according to Claim 2, wherein said second reflection film is made of a III-V group compound semiconductor in which an average Al composition is not less than 0.4 and said electric current spreading layer is made of a III-V group compound semiconductor in which an Al

composition is not less than 0.2.

11. A light-emitting semiconductor device according to Claim 9, wherein said first semiconductor is made of $\text{Al}_j\text{Ga}_{1-j}\text{As}$, ($0 \leq j$), and said second semiconductor is made of $\text{Al}_k\text{Ga}_{1-k}\text{As}$, ($j < k \leq 1$), and said electric current spreading layer is made of $\text{In}_d(\text{Ga}_{1-c}\text{Al}_c)_{1-d}\text{P}$, ($0 < c \leq 1$, $0 \leq d < 1$).

12. A light-emitting semiconductor device according to Claim 10, wherein said first semiconductor is made of $\text{Al}_j\text{Ga}_{1-j}\text{As}$, ($0 \leq j$), and said second semiconductor is made of $\text{Al}_k\text{Ga}_{1-k}\text{As}$, ($j < k \leq 1$), and said electric current spreading layer is made of $\text{In}_d(\text{Ga}_{1-c}\text{Al}_c)_{1-d}\text{P}$, ($0 < c \leq 1$, $0 \leq d < 1$).

13. A light-emitting semiconductor device according to Claim 1, wherein the number of stacked pairs of said first and second semiconductors ranges from 4 to 12.

14. A light-emitting semiconductor device according to Claim 3, wherein the number of stacked pairs of said first and second semiconductors ranges from 4 to 12.

15. A light-emitting semiconductor device according to Claim 5, wherein the number of stacked pairs of said first and second semiconductors ranges from 4 to 12.

16. A light-emitting semiconductor device according to Claim 7, wherein the number of stacked pairs of said first and second semiconductors ranges from 4 to 12.

5 17. A light-emitting semiconductor device according to Claim 9, wherein the number of stacked pairs of said first and second semiconductors ranges from 4 to 12.

10 18. A light-emitting semiconductor device according to Claim 11, wherein the number of stacked pairs of said first and second semiconductors ranges from 4 to 12.

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